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SHORT AND LONG TERM IMPACT OF THE CORONA PANDEMIC ON RE INSTALLATION



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DEVELOPING SOLAR PV MINIGRID
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COVER STORY



Impact Of Coronavirus Outbreak On Propagation Of Solar Energy In India
Dipankar Ghosh, Partner And Dr. Remant K. Tiwari, Thinkthrough Consulting

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IMPACT OF CORONAVIRUS OUTBREAK ON PROPAGATION OF SOLAR ENERGY IN INDIA

In the following article, **Mr. Dipankar Ghosh - Partner** and **Mr. Remant K. Tiwari, Thinkthrough Consulting**, analyze the status of the RE installations over current, short and long periods of time, in the wake of the Corona pandemic that has led to slowdown in projects due to abrupt stalling of all import and export activities especially in highly import-intense regions such as the Indian subcontinent, amidst growing concerns around safety across the globe with the number of infected cases rising every day.



CORONAVIRUS OUTBREAK HAVE CASCADING EFFECTS ON ECONOMY

The initial decades of the 21st century will be remembered for its major innovations as well as disruptions. The latter include economic slowdown due to systemic failure, natural disasters due to climate change and health scares of pandemic scale. Currently, the world is held hostage to Coronavirus (CoV) disease caused by Covid 19 strain and the World Health Organization (WHO) has declared it as a pandemic. The spread of CoV infection has been unprecedented, leveraging the deep connectivity and ease of movement across the borders in the globalized world.

With the entire world reeling under this health emergency, restrictions on operations of facilities, movements of men and goods, have been imposed both domestically and internationally. As a result, both manufacturing and logistics are affected, which in turn is affecting the supply chain and availability of products in the market.

China is one of the major manufacturing hubs of the world for machinery, electronics and components. As India moves towards sustainable energy, its dependence on China has increased for procuring components for solar panels. Through this article, we aim to explore the impact of CoV pandemic on the solar installations in India.

SOLAR POWER OUTLOOK IS POSITIVE IN INDIA

According to the Paris Agreement Commitments, India aims to achieve 175 GW of renewable energy capacity by 2022. Of this, the country's solar capabilities are expected to contribute 100 GW. India had a total of 84 GW of installed capacity of renewable electricity as of 2019, out of which, 37 GW was contributed to by wind power while the rest 32 GW came from solar. Installed solar power generation capacity is projected to overtake the country's wind power capacity by 2022 [IBEF]. The country is committed to fulfil 40% of total energy demand through non-fossil fuel sources by 2030 [PIB Press Release].

Due to its favourable geographical location, India receives a good amount of insolation, offering conducive conditions for harnessing solar power at scale. Driven by strong political commitments, substantial investments, and geographical location, solar power generation has seen a steep rise in the last decade; the cumulative installed capacity has increased from 11.35 MW in 2010 to 28 GW in 2018.

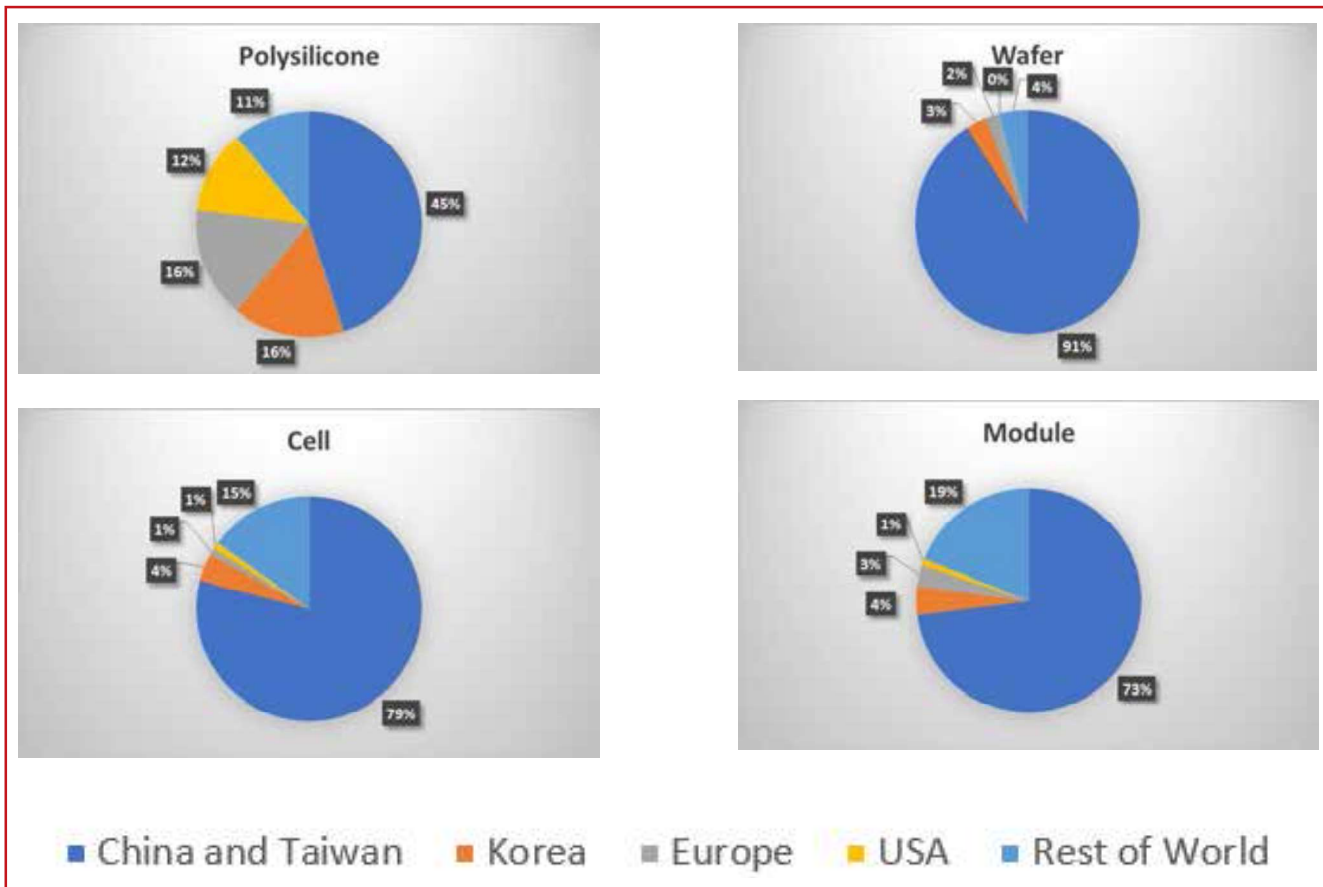
Despite these favourable factors, the adoption of solar energy depends on market factors such as cost of solar equipment, transition of technology, fossil fuel prices, etc. Supply-chain stability is one of the major factors affecting the installation costs for a solar power plants, while the future scalability of solar energy depends on the interplay between demand [such as fossil fuel prices and net tariffs] and supply-side factors [supply chain and technology controls].



The spread of CoV infection has been unprecedented, leveraging the deep connectivity and ease of movement across the borders in the globalized world

CHINA PLAYS A CRITICAL ROLE IN SOLAR ENERGY SUPPLY CHAIN

Of the total solar installation of 32 GW in India as, well as those in immediate pipeline, Concentrated Solar Power (CSP) technology contributes less than 1 GW. The major contribution is from Photovoltaic (PV), and we have therefore limited this discussion to PV technology supply chain. The key components for PV installations are Polysilicon, Ingot & Wafer, Crystalline Cell, Crystalline Module, Battery Storage Systems, Tracking Systems, and Power Systems. Accessory components include Power Semiconductor Devices, Inverter Subcomponents, and Control & Monitoring Devices. India depends on import for many of these components. An analysis of top 500 manufacturers of Polysilicon, Ingot & Wafer, Cell and Modules, conducted by the National Renewable Energy Laboratory (NREL), USA, indicates that 45% of Polysilicon, 91% of Wafer, 79% of Crystalline Cell, and 73% of Crystalline Module manufacturing capacity is in China and Taiwan [National Renewable Energy Laboratory (NREL) 2018]. Furthermore, due to cheap labour and economies of scale, components sourced from China and Taiwan are approximately 15-20% cheaper than those sourced from other parts of the world. The geographical distribution of major suppliers of these components are depicted as follows:



Source: National Renewable Energy Laboratory [NREL] [2018]

CORONAVIRUS PANDEMIC HAS IMPACTED SOLAR ENERGY SUPPLY CHAIN ADVERSELY

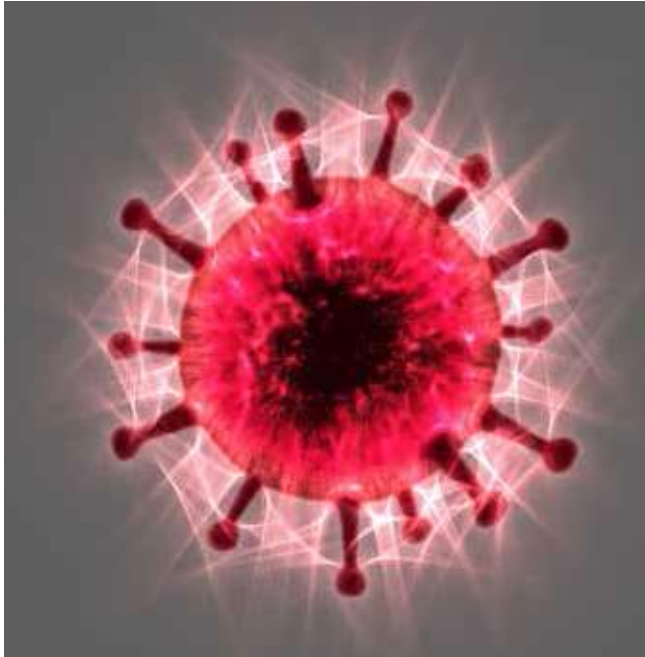
The coronavirus outbreak originated in Wuhan, the capital of China's Hubei province, which happens to be among country's prime manufacturing hubs. Two of the top three manufacturers of solar components - Trina Solar (a subsidiary of Fortune Solar Holdings Limited) and China Sunergy - are located in the Jiangsu, some other major manufacturers are in Shanghai; both these provinces, situated close to Hubei, were among the regions subjected to shut-down due to outbreak. Most of the manufacturers in these provinces are yet to resume manufacturing since Chinese New Year's Holiday.

Another major solar components' manufacturer - South Korea - has also been affected by Covid outbreak. Shutdowns in China and South Korea, caused by the outbreak, have disrupted the supply chain of several industries, including that of solar energy generation. Not only a set of major components are almost exclusively sourced from China, many sub-components of other accessories (those are manufactured or assembled domestically in India), are also sourced from China. It is estimated that around 80% of the cells and modules used in India are imported from China [livemint]. Naturally therefore, the outbreak has been extremely disruptive for the solar supply chain, resulting in adverse outcomes for Indian solar energy generation.

IMPACT ON GRID CONNECTED SOLAR PLANTS: COMMISSIONING WILL GET DELAYED

As per the prevailing industry practices, orders for modules and cells are placed approximately 6 months prior to the Scheduled Commercial Operation Date (SCOD). Therefore, the plants which have SCOD in the second quarter of the Financial Year 2020-21, would have placed order during January 2020 to March 2020 - the peak of outbreak. Furthermore, power plants having SCOD in the first quarter of the FY 2020-21, were set to receive the supplies during this period. Therefore, these plants are expected to be the worst affected. Switching to alternative suppliers located in other regions is likely to increase the cost of supplies by at least 15%. Furthermore, availability of such suppliers is also uncertain, leaving developers with no alternative but to delay the SCOD. On a macro level, this means that the commissioning of solar power plants with estimated cumulative capacity of 6-8 GW will be delayed by at least 4-6 months.

Study of the Power Purchase Agreements (PPA) signed between the State Discoms and Developers available in the public domain reveal that any delay in SCOD invites monetary penalties. Such penalties typically increase substantially if SCOD gets delayed beyond one month. Furthermore, any delay beyond three months results in downward revision of agreed tariff. Aggregate loss to developers for 4-6 months' delay is expected to be staggering.



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To avoid such loss, the developers have considered invoking force majeure provision that pertains to the relief admissible under unforeseen and uncontrollable events. However, the qualification of disease outbreak for justifying force majeure is prompting additional regulatory deliberations.

The proposed power plants having SCOD in the latter half of FY 2020-21 may not face challenges from supply chain unless manufacturing and logistics disruption continue for over multiple months. Many Chinese manufacturers are known to operate at low capacity utilization, and usually would have reasonable excess capacity to be able to fulfil orders including backlogs when manufacturing resumes.

IMPACT ON OFF-GRID SOLAR FACILITIES: COST INCREASE MAY REDUCE DEMAND

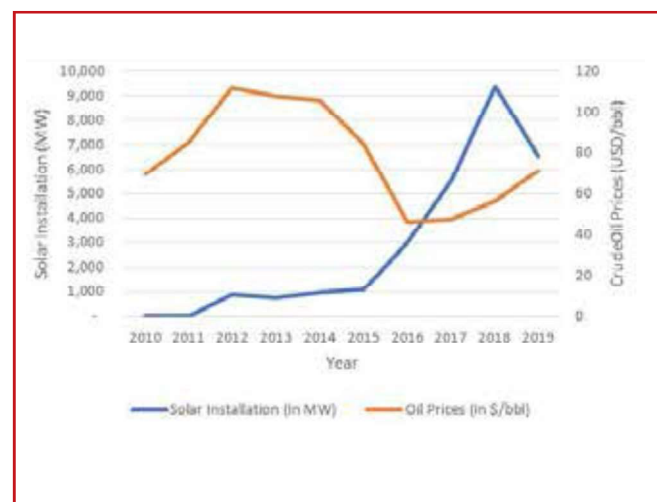
Demand is a function of the price. The price sensitivity of Indian market increases price elasticity of demand. Demand-side impact will be largely seen in the Rooftop and Captive Solar Power Generation segments. Two key factors will determine the scale of this impact:

First, switching to alternative suppliers may increase the cost of solar panels by 15-20%, which will increase the capital cost of rooftop solar installation. This increased cost will result in a reduced demand in the rooftop segment.

The second and the more important of the two factors is the impact of Covid outbreak on the Indian economy. In the worst-case scenario, an extended large-scale shutdown will impact the manufacturing sector and significantly depress consumption. It is perceived that the combination of these two trends will adversely affect the profitability of Indian companies. Under such circumstances, the overall market demand of Captive Solar Power Generation by Indian manufacturers is likely to suffer substantially.

OIL PRICES HAVE COMPLEX RELATIONSHIP WITH RENEWABLES

The Covid outbreak is expected to have a downward push on the crude oil prices. Widespread shutdowns and significant drop in the domestic and international travels in the wake of the pandemic will drastically reduce oil demand. In addition, ongoing geo-political complications have adversely affected the global oil prices. Together, these factors have precipitated in a crash in global oil prices. Intuitively, a crash in oil prices should have adverse impact on the adoption of cleaner energy. However, any such impact will be followed by a lag, because switching to another energy source needs time for planning, installation, and operations. The chart below compares trends in crude oil prices and solar installations over past 10 years, indicating that oil prices and solar installations move together with a lag of 4-5 years. A steep rise in oil prices during 2011-12 may have resulted in steep rise in solar installations during 2015-18; conversely, a steep fall in crude prices during 2015-16 may have caused a fall in solar installation in 2018-19. However, the available data is insufficient and suffers from several counterfactual factors. Some experts believe that volatility in global oil prices and sustainability considerations will drive more investment in renewable energy sources. Therefore, it is difficult to draw any definitive conclusion regarding the impact of oil prices on solar installations.





LONG TERM: DOMESTIC MANUFACTURING MAY GET A BOOST

The Covid pandemic has exposed the perils of a 'concentrated supply chain'. Going forward, businesses will strongly consider and act on diversifying supplier base and plan for import substitution. Like many other sectors, where supply chain sustainability is being considered seriously, the renewable energy sector too would need to look into it critically. It is expected that this pandemic will encourage efforts to augment the enabling environment conducive for attracting greater investments into import substitution. There is an opportunity here for Indian manufacturers - operating in all sectors, not just renewables - to boost domestic production and add flexibility to their supply capabilities.

CONCLUSION

It is clear that renewable energy installations are affected by

a multiplicity of factors, such as political will, investments, consumer awareness and eco-consciousness, oil prices, etc. It is therefore important to recognise the complex interdependencies between these factors. Covid pandemic will have adverse impacts on solar energy propagation in India - at least in the short term. However, the exact nature and scale of these impacts in medium and long-term will depend on how quickly outbreak is controlled. A prolonged disruption will trigger systemic cascading effects and significantly constrain and delay the recovery process. Having tested the resilience of Indian manufacturing, this crisis also presents a valuable opportunity to recognize the importance of import substitution and self-reliance. It is time to augment domestic capabilities and supply chains to stay on track to meet our sustainability goals as a nation.



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